MINERALOGICAL ABSTRACTS

(Vol. 8, No. 11, September, 1943.)

X-rays and Crystal-structure.

(Max). *Thermodynamics of crystals and melting.* Journ. Chem. Physics (Amer. Inst. Phys.), 1939, vol. 7, pp. 591–603, 8 figs.

On the stability of crystal lattices. I. Proc. Cambridge Phil. Soc., 1940, vol. 36, pp. 160–172.

(Rama Dhar). *On the stability of crystal lattices. II.* Ibid., pp. 173–182, 1 fig.

(M.) & Fürth (R.). *On the stability of crystal lattices. III. An attempt to calculate the tensile strength of a cubic lattice by purely static considerations.* Ibid., pp. 454–465, 1 fig.

& Misra (Rama Dhar). *On the stability of crystal lattices. IV.* Ibid., pp. 466–478.

h (R.). *The stability of crystal lattices. V. Experimental evidence on recent theories of the equation of state and the melting of solids.* Ibid., 1941, vol. 37, pp. 34–54, 4 figs.

thematical and theoretical dealing with the thermodynamics and stability e simplest crystal lattices (monatomic substances or simple non-polar ules). It is shown that the simple cubic lattice will never be stable, the body- ed cubic only under special conditions, the face-centred cubic normally. ailure of previous theories and of the present one to give values for the ten- trength of crystals in accord with experimental data is put down to neglect at movement of the atoms rather than crystal imperfections; the latter l have to be of macroscopic, not atomic, dimensions to account for the ob- d discrepancy. The melting-point of a crystal is taken to be that temperature hich the shearing strength vanishes; this theory predicts successfully the eisen relations between the volume at the melting-point and at the absolute and between the specific volume and the compressibility of crystals, the tion of the elastic constants of crystals with temperature, and the melting es of the inert gases. The relation between melting and breaking is discussed, a simple relation found between the melting energy, the sublimation energy, he densities of the crystal and liquid. M. H. H.

nier (Gregory H.). *Melting as an order-disorder transition.* Journ. Chem. Physics (Amer. Inst. Phys.), 1939, vol. 7, pp. 810–817, 6 figs.

theoretical discussion of the melting process in a diamond-type lattice. The ts are not very satisfactory, but the existence of a sharp melting-point, and onnexion between order-disorder transition in alloys and melting are estab- d. M. H. H.

th (R.). *Relation between breaking and melting.* Nature, London, 1940, vol. 145, p. 741.

n (Max). ——. Ibid., pp. 741–742.

he breaking strength of an isotropic solid approximates to the heat of melting

per unit volume; a theoretical derivation of this empirical result appears to possible. The breaking strength is not a 'structure-sensitive' property.
M. H. H.

Mott (N. F.). *Theories of the liquid state.* Nature, London, 1940, vol. 14 pp. 801–802.

A review of recent work. The theory of melting is still in an unsatisfacto state. M. H. H.

Patterson (A. L.) & Tunell (George). *A method for the summation of the Fouri series used in the X-ray analysis of crystal structures.* Amer. Min., 194 vol. 27, pp. 655–679, 10 figs.

Describes the use of a set of 1800 cardboard strips (F-values 0 to 300, positi and negative, three strips of each kind) for the summation of one-dimension Fourier series. Thence a procedure of summing two-dimensional series utiliz in crystal-structure determinations is detailed. The method closely resembl those of Robertson [M.A. **6**–404] and of Lipson and Beevers but differs fro either in that the selection of numbers to be added from the series of strips for given point of the unit cell is accomplished by one of a set of stencils. F. A. B.

Kochendörfer (Albert). *Linienverbreiterung bei cosinusförmigen Gitterstö ungen.* Zeits. Krist., 1939, vol. 101, pp. 149–155, 2 figs.

It is calculated that sinusoidal lattice deformations yield symmetrically di placed doublets for every normal Bragg diffraction. This effect must be allow for in the calculation of line breadth of X-ray powder photographs of lattic when rapidly distorted. F. A. B.

Dehlinger (Ulrich) & Kochendörfer (Albert). *Linienverbreiterung von ve formten Metallen.* Zeits. Krist., 1939, vol. 101, pp. 134–148, 5 figs.

Measurements of the breadth of lines on powder photographs of samples rolled and drawn copper are given and discussed. The average particle size thence calculated (4×10^{-6} cm.) and also the change in lattice dimensions.
F. A. B.

Edwards (Olive S.) & Lipson (H.). *Imperfections in the structure of cobalt. Experimental work and proposed structure.* Proc. Roy. Soc. London, Ser. 1942, vol. 180, pp. 268–277, 1 pl., 2 text-figs.

Wilson (A. J. C.). —— *II. Mathematical treatment of proposed structure.* Ibi pp. 277–285, 2 figs. [M.A. **8**–284.]

Hume-Rothery (W.) & Andrews (K. W.). *The lattice spacing and therm expansion of copper.* Journ. Inst. Metals, 1942, vol. 68, pp. 19–26, 1 fig.

The estimated cell-side for pure copper is *a* 3·6074 Å. Small amounts of in purities cause slight differences. Expansion agrees with that of massive copp up to 500°, above which it is smaller, probably due to gas in the massive metal
L. J. S.

Hess (Bernhard). *Weitwinkel-Strukturaufnahmen auf Kugelflächen.* Zeit Krist., 1942, vol. 104, pp. 294–304, 5 figs.

Kossell lines for a specimen of aluminium are photographed in a hemispheric back-camera, the specimen serving as the anode of the X-ray tube. The unit ce

for aluminium determined by this method is 4·057 Å. ±3 %, and it is also how to derive the Laue symmetry and orientation of the specimen.

F. A. B.

(S. V.) & Peacock (M. A.). *A preliminary study of the alloys of palladium and bismuth.* Univ. Toronto Studies, Geol. Ser., 1942, no. 47, pp. 19–31, 24 figs.

tallic Bi and Pd (*a* 3·882 Å.) were fused in various proportions in evacuated -glass tubes giving white metallic products in which four compounds were nized. The Bi-phase holds less than 3 % Pd in solid solution. α-$PdBi_2$ (low erature) is monoclinic; the unit cell with *a* 12·72, *b* 4·28, *c* 5·66 Å., β 77° 8′, -group $C_{2h}^3 = C2/m$, or $C_2^3 = C2$, or $C_s^3 = Cm$, contains 4[$PdBi_2$]. Cleavage perfect, ($\bar{1}02$) poor; twinning lamellar; brittle; hardness B (Talmage); . 11·53, 11·50. β-$PdBi_2$ (high temperature) is anisotropic and has a perfect age giving flexible folia; hardness B; sp. gr. 11·67, 11·66. PdBi is ortho- bic or monoclinic; brittle, with cleavage in three directions in one zone; ness B; sp. gr. 12·85. Pd_5Bi_3 is anisotropic, brittle, and tough with one age; hardness C; sp. gr. 12·52, 12·50. The Pd-phase takes nearly 25 % Bi solid solution, the product Pd_{75}–Bi_{25} being nearly cubic with *a* 4·070 Å. y powder spacings and intensities are given for each of the compounds and patterns with Cu-*Kα* radiation are reproduced. M. A. P.

m-Grzhimailo (N. V.)] Грум-Гржимайло (Н. В.) Grum-Grzimaylo (N. V.). *On the law of the changes of the crystalline lattice parameter of solid solutions.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 33, pp. 237–240, 3 figs.

gard's additive rule does not apply to mixed crystals when the series con- intermediate compounds. Equations and curves give the parameters for ystems Fe–Si (with the compound Fe_3Si), Fe–Al (with FeAl and Fe_3Al), and Pd (with FePd, $FePd_3$, and an assumed compound Fe_3Pd). [M.A. **2**–507, 2, **6**–37.] L. J. S.

ulze (Gustav E. R.). *Kristallstruktur von $LaAl_2$.* Zeits. Krist., 1942, vol. 104, pp. 257–260, 1 fig.

om indexed powder data the alloy $LaAl_2$, sp. gr. 4·76, is found to be cubic, 115 Å. It is close in cell dimensions and properties to $CeAl_2$, both having tal-structures of the $MgCu_2$ type. F. A. B.

litz (Harald) & Westgren (A.). *The crystal structure of $Al_8Si_6Mg_3Fe$.* Arkiv Kemi, Min. Geol., 1942, vol. 15B, no. 16, 8 pp., 1 fig.

inute tabular crystals, sp. gr. 2·82, isolated by dissolving aluminium alloys id, are hexagonal, with *a* 6·62, *c* 7·92 Å., space-group $D_{3h}^3 = C\bar{6}2m$. The tions of the atoms are determined. L. J. S.

ler (Joh.-E.). *Versuch einer Klassifikation der Sulfide nach strukturellen Gesichtspunkten.* Zeits. Krist., 1940, vol. 102, pp. 353–376.

classification of mineral sulphides, selenides, tellurides, and sulpho-salts, ng the chemical formula and system of crystallization of each, and, when rmined, the dimensions of the unit cell, number of molecules, and space- p, together with references to the literature. [M.A. **8**–280.] L. J. S.

Buerger (Newton W.). *X-ray evidence of the existence of the mineral digeni Cu_9S_5.* Amer. Min., 1942, vol. 27, pp. 712–716.

Digenite from Mansfeld, Germany, gives the same X-ray powder pattern artificially prepared cubic Cu_9S_5. The so-called isometric blue chalcosine fr Jerome in Arizona, Kennecott in Alaska, Butte in Montana, Khan mine a Tsumeb in South-West Africa all give the same pattern and should all be call digenite. Carmenite, however, gives covelline lines with those of one or m unidentified minerals. This last species should, therefore, be discredited a digenite reinstated. F. A. B.

Peacock (M. A.). *Studies of mineral sulpho-salts: VI—aikinite.* Univ. Toron Studies, Geol. Ser., 1942, no. 47, pp. 63–69, 3 figs.

Aikinite (sp. gr. 7·08, 7·09) from Beresovsk, Ural Mts., is orthorhombic wi space-group $D_{2h}^{16} = Pnam$ or $C_{2v}^{9} = Pna2$. The unit cell with a 11·30, b 11·6 c 4·00 Å. contains $Cu_4Pb_4Bi_4S_{12} = 2[Cu_2S.2PbS.Bi_2S_3]$. The X-ray powder patte (Cu-$K\alpha$ radiation) is reproduced and indexed to $\theta = 30°$. Aikinite is not is structural with bournonite and seligmannite, but the symmetry and cell dime sions compare with those of bismuthinite. M. A. P.

Straumanis (M.) & Sauka (J.). *Präzisionsbestimmung der Gitterkonstanten u Ausdehnungskoeffizienten rhombischer Kristalle am Beispiel des Bleichlori* Zeits. Physikal. Chem., Abt. B, 1942, vol. 51, pp. 219–228, 1 fig.

Oscillation photographs about two axes at right angles gave for $PbCl_2$ 18° C. a 4·52476, b 7·60446, c 9·02666 Å., and at 55° C. a 4·53043, b 7·6151 c 9·03225 Å. [M.A. **5**–118, 176.] L. J. S.

Scholten (W.) & Bijvoet (J. M.). *Die Kristallstruktur des Quecksilber-Chlo bromids $Hg(Cl,Br)_2$.* Zeits. Krist., 1941, vol. 103, pp. 415–419, 4 figs.

$HgCl_2$–$HgBr_2$ forms three phases at ordinary temperature: α, 0–55 mol. % $HgBr_2$, with $HgCl_2$ structure; β, 55–60 mol. % $HgBr_2$; γ, 95(?)–100 mol. % $HgBr_2$, with $HgBr_2$ structure. The structure of the β form with linear X–Hg– molecules is nearer to that of $HgCl_2$ [M.A. **6**–39] into which it easily passes; has a 6·78, b 13·17, c 4·10 Å., with four molecules in the unit cell, calc. d 5·6 space-group $V^4 = P2_12_12_1$. L. J. S.

Clark (D.), Powell (H. M.), & Wells (A. F.). *The crystal structure of phosphor pentachloride.* Journ. Chem. Soc. London, 1942, pp. 642–645, 3 figs.

The tetragonal unit cell of PCl_5 contains tetrahedral PCl_4^+ and octahedr PCl_6^- groups, a 9·22, c 7·44 Å., space-group $P4/n$. Etch-figures on (001) show t absence of vertical planes of symmetry. L. J. S.

[Boky (G. B.) & Usikov (P. I.)] Бокий (Г. Б.) и Усиков (П. И.) Boky (G. B. and Ussikov (P. I.). *Röntgenographische Untersuchung der Struktur d Ammonium-Chlor-Iridats $(NH_4)_2IrCl_6$.* Compt. Rend. (Doklady) Acad. S URSS, 1940, vol. 26, pp. 782–784, 3 figs.

Ammonium chloriridate, sp. gr. 3·03, cubic cell with edge a 9·87 Å., containi $4(NH_4)_2IrCl_6$ has space-group $O_h^5 = Fm3m$. The positions of the ions in t crystal-structure, which is of the K_2PtCl_6 type, are given. F. A. B.

ÉN (Lars Gunnar) & MELANDER (Lars). *X-ray studies on the oxyhalide minerals nadorite (ochrolite) $PbSbO_2Cl$ and ekdemite.* Zeits. Krist., 1941, vol. 103, pp. 420–430, 2 figs.

adorite from Jebel Nador, Algeria, is orthorhombic with $4PbSbO_2Cl$ in the cell a 5·59$_1$, b 5·43$_1$, c 12·20 Å., calc. d 7·05, space-group $D_{2h}^{17} = Bmmb$. The ture consists of sheets of metal and oxygen separated by sheets of chlorine s parallel to the perfect cleavage. Nadorite from Långban and ochrolite Pajsberg, Sweden, gave identical X-ray patterns. Fusing $PbCl_2$ with $_3$ gave two modifications of $PbSbO_2Cl$: tetragonal, a 3·887, c 12·26 Å.; and orhombic, a 5·58$_5$, b 5·43$_1$, c 12·21 Å., identical with nadorite. Ekdemite Harstigen, Sweden, shows tetragonal symmetry $4/mmm$ with a 10·8, 6 Å., but the crystals are in part optically biaxial and in part uniaxial; the ula is perhaps $Pb_3AsO_4Cl_2$. L. J. S.

NZ (H.). *Formel und systematische Stellung von Ekdemit und Heliophyllit.* Naturwiss., 1942, vol. 30, p. 89.

eview and criticism of Sillén and Melander [preceding abstract]. The formula eliophyllite and ekdemite is written as $Pb_3AsO_{<4}Cl_{<2}$ with some vacant O Cl positions. Heliophyllite is considered to be orthorhombic (pseudo-agonal) and ekdemite tetragonal with a similar structure. These are paired nadorite (orthorhombic) and artificial tetragonal $PbSbO_2Cl$ respectively, h show related structures. L. J. S.

INSHTEIN (E.)] Вайнштейн (Э.) WAINSTEIN (E.). *Study of the bent of quartz crystals with the help of a Cauchois spectrograph.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1942, vol. 34, pp. 107–109, 3 figs.

— *X-ray spectrographic investigation of the bent of mica crystals made with the aid of a Johann spectrograph.* Ibid., 1942, vol. 35, pp. 233–235.

iscusses the distortion of X-ray photographs from slightly bent laminae of rtz and mica. L. J. S.

OßBERGER (F.). *Über die Umwandlung des Titandioxyds.* Zeits. Krist., 1942, vol. 104, pp. 358–374, 1 fig.

rtificial anatase has unit-cell dimensions a 3·776, c 9·486 Å., artificial rutile, 589, c 2·954 Å. The hydrolysis of sulphuric acid solutions of titania yields tase which changes to rutile at temperatures between 600° and 1200° C. drochloric acid solutions, however, yield rutile. The specific gravities of the thetic anatase have been determined after heating the product at various peratures, from which data it is concluded that SO_3 can enter the anatase ice and produce a more stable product. F. A. B.

IIN (Karl Erik) & WESTGREN (A.). *The lattice parameters of the cubic As_2O_3 and Sb_2O_3.* Arkiv Kemi, Min. Geol., 1942, vol. 15B, no. 22, 6 pp.

he lattice dimensions of prepared crystals, As_2O_3 a 11·05 Å., Sb_2O_3 a 11·13 Å., ee with those of Bozorth [M.A. **2**–197], while the parameters and atomic ances, As–As 3·23, As–O 1·80, Sb–O 2·0 Å., agree with those of Buerger and dricks [M.A. **7**–85] and of Hampson and Stosick [M.A. **7**–235]. L. J. S.

SON (Brian). *Bixbyite from Långban. The identity of bixbyite and sitaparite.* Geol. För. Förh. Stockholm, 1942, vol. 64, pp. 117–125, 2 figs.

ixbyite from Långban, sp. gr. 4·93, with cell edge a 9·39±0·01 Å., gives

Mn_2O_3 76·0, Fe_2O_3 21·9, TiO_2 1·3, total 99·2. The lattice dimension for bixby from Thomas range, Utah, is determined as 9·38 Å. in good agreement with p vious values [M.A. **3**–527, **4**–364]. Sitaparite from Central Provinces, Ind containing 6·14 % CaO, showing weak anisotropism and traces of polysynthe twinning, gives powder photographs identical with those of sitaparite from Pe masburg, South Africa, and of bixbyite. Whilst H. Strunz (1941) proposes retain both mineral names the author prefers to retain bixbyite only. F. A. B

Wallmark (Signe) & Westgren (A.). *X-ray analysis of barium alumina* Arkiv Kemi, Min. Geol., 1937, vol. 12B, no. 35, 4 pp., 1 fig.

Barium monoaluminate has an hexagonal unit cell a 5·209, c 8·761 Å., conta ing $2BaAl_2O_4$ with space-group $D_6^6 = C6_32$. The crystal-structure paramet have been derived from indexed powder data. A second phase has also b prepared with composition near to $BaO.5–6Al_2O_3$, also hexagonal, a 5·5 c 22·67 Å. and isomorphous with β-alumina. F. A. B

McMurdie (Howard F.). *Structure of tricalcium aluminate.* Journ. Resea National Bureau Standards, U.S.A., 1941, vol. 27, pp. 499–505. (Resea Paper 1439.)

X-ray powder data are given for $Ca_3Al_2O_6$, $Sr_3Al_2O_6$, $CaTiO_3$, and Na_2CaSi The unit cell of tricalcium aluminate, containing $24Ca_3Al_2O_6$ has a 15·24 Å. w a similar crystal-structure to that of the strontium aluminate with a 15·82 All four compounds yield strong lines in their powder patterns corresponding t body-centred cube cell with a 3·81 Å., showing that the metal atoms of all fo compounds are arranged similarly. F. A. B.

Ramdohr (P.) & Strunz (H.). *Isomorphie von Otavit mit Kalkspat.* Zentralbl Min., Abt. A, 1941, pp. 97–98.

Otavite, previously described as a basic carbonate of cadmium from Tsume South-West Africa, forms thin crusts of minute rhombohedra often in paral growth on smithsonite. X-ray powder photographs agree with Zachariase (1928) determination for artificial $CdCO_3$, a 6·11 Å., α 47° 24′, with calcite stru ture and two molecules in the unit cell. L. J. S.

[Vainshtein (E.)] Вайнштейн (Э.) Wainstein (E.). *Some peculiarities of the p cess of plastic deformation in gypsum crystals.* Compt. Rend. (Doklad Acad. Sci. URSS, 1942, vol. 34, pp. 249–251, 4 figs.

The fine structure of spots on X-ray photographs of bent cleavages of gypsu suggests the possible curvature of atomic planes. F. A. B.

Seifert (H.). *Die Kristallographie von Cäsiumfluorsulfonat, $CsSO_3F$.* Zei Krist., 1942, vol. 104, pp. 385–393.

Small tetragonal plates of caesium fluosulphonate, forms (001), (112), ha axial ratio $a:c = 1:2·5184$; refractive indices ω 1·4755, ϵ 1·4645, and the u cell, containing $4CsSO_3F$, measures a $5·610 \pm 0·006$, c $14·133 \pm 0·009$ Å., spa group $I4_1a = C_{4h}^6$. The compound has a crystal-structure of the scheelite ty with the oxygen and fluorine atoms distributed statistically over the 16-f position. Indexed powder data are given. F. A. B.

DY (Selma Blazer). *An X-ray investigation of the structure of lead chromate.* Journ. Chem. Physics (Amer. Inst. Physics), 1942, vol. 10, pp. 650–652.

otation and Weissenberg photographs about the *b* and *c* axes of natural and ficial crystals of crocoite fix the positions of the Pb and Cr atoms. Oxygen ms have a co-ordination of eight or possibly more around Pb. Photoblacken- seems to involve a breakdown of the structure. [M.A. **5**–27, **7**–394.]

L. J. S.

LSON (Ingvar A.). *X-ray analysis of potassium perchromate K_3CrO_8 and isomorphous compounds.* Arkiv Kemi, Min. Geol. Stockholm, 1941, vol. 15B, no. 5, 7 pp., 2 figs.

$_3CrO_8$ (*a* 6·70, *c* 7·60 Å.), K_3NbO_8 (*a* 6·78, *c* 7·86 Å.), K_3TaO_8 (*a* 6·78, *c* 7·88 Å.), $_3TaO_8$ (*a* 7·05, *c* 8·05 Å.), and Cs_3TaO_8 (*a* 7·37, *c* 8·34 Å.) were prepared by ing H_2O_2 to slightly alkaline solutions of the corresponding chromates, ates, and tantalates. They are isomorphous with space-group $D_{2d}^{11} = I\bar{4}2m$ contain two molecules in the unit cell. L. J. S.

GNÉLI (Arne). *The crystal structure of lead metantimonate and isomorphous compounds.* Arkiv Kemi, Min. Geol. Stockholm, 1941, vol. 15B, no. 3, 6 pp., 1 fig.

Meta-antimonates of Ca, Sr, Ba, Cd, Hg, Pb and meta-arsenates of Ca, Sr, Cd, Hg, Co were prepared by heating the carbonates (or oxides) with Sb_2O_3 or As_2O_5. ey are isomorphous with space-group $D_3^1 = C312$ and one molecule in the mbohedral unit cell. X-ray data are given for each: for $CaSb_2O_6$, *a* 5·222, ·010 Å.; $CaAs_2O_6$, *a* 4·818, *c* 5·069, Å.; $PbSb_2O_6$, *a* 5·287, *c* 5·364 Å.; $PbAs_2O_6$, ·859, *c* 5·481 Å. L. J. S.

STRÖM (Anders), HÖK (Brita), & MASON (Brian). *The crystal structure of zinc metantimonate and similar compounds.* Arkiv Kemi, Min. Geol. Stockholm, 1941, vol. 15B, no. 4, 8 pp.

Meta-antimonates of Zn, Mg, Fe, Co, Ni and tantalates of Mg, Fe, Co, Ni were pared by heating the metal oxides with Sb_2O_3 or Ta. They are isomorphous th tapiolite ($FeTa_2O_6$) and mossite, and have the trirutile type of structure th space-group $D_{4h}^{14} = P4/mnm$ and two molecules in the unit cell. X-ray ta are given for each: for $ZnSb_2O_6$, *a* 4·66, *c* 9·24 Å.; $FeSb_2O_6$, *a* 4·62, *c* 9·19 Å.; Ta_2O_6, *a* 4·67, *c* 9·14 Å. $CuSb_2O_6$ is monoclinic with a deformed trirutile ucture, *a* 4·62, *b* 4·62, *c* 9·28 Å., β 88½°, space-group $C_{2h}^5 = P2_1/c$. L. J. S.

ÖRLING (Carl Olof). *The crystal structure of potassium hydroxo-stannate and some related compounds.* Arkiv Kemi, Min. Geol. Stockholm, 1941, vol. 15B, no. 2, 6 pp., 2 figs.

The following isomorphous compounds each contain one molecule in the mbohedral unit cell with space-group $C_{3i}^2 = R\bar{3}$. $K_2Sn(OH)_6$, *a* 5·68 Å., 70·1°, *a* 6·53, *c* 12·75 Å.; $Na_2Sn(OH)_6$, *a* 5·84 Å., α 61·2°, *a* 5·95, *c* 14·17 Å.; $_2Pt(OH)_6$, *a* 5·65 Å., α 69·0°, *a* 6·40, *c* 12·81 Å. L. J. S.

CONNELL (Duncan). *X-ray data on several phosphate minerals.* Amer. Journ. Sci., 1942, vol. 240, pp. 649–657.

X-ray powder data and chemical analyses of dussertite from Jebel Debar,

Algeria, and pseudowavellite from Fairfield, Utah, are given showing them to l members of the alunite and jarosite families respectively. Powder data are al given for woodhouseite (stated to be indistinguishable from pseudowavellite b X-ray methods alone) and for sarcopside from Deering, New Hampshire.

F. A. B.

Bengtsson (Edvard). *An X-ray study of monetites and some related compound* Arkiv Kemi, Min. Geol. Stockholm, 1941, vol. 15B, no. 7, 8 pp.

$BaHPO_4$ and $PbHPO_4$, analogous to monetite ($CaHPO_4$, triclinic), were pr pared by A. de Schulten's method [Min. Mag. **21**–149]. $BaHPO_4$ is orthorhomb with a 4·61, b 14·08, c 17·10 Å., with 12 molecules, space-group $D_{2h}^{10} = Pbnl$ $PbHPO_4$ is monoclinic, a 4·65, b 6·63, c 5·76, β 82·8°, with two molecules, space-grou C_{2h}^4 or C_s^2. Data are also given for $BaPO_3F$, $BaRbPO_4$, and $RbHSO_4$. L. J. S.

Strunz (H.). *Isotypie zwischen $YPO_4.2H_2O$ and $CaSO_4.2H_2O$.* Naturwiss 1942, vol. 30, p. 64.

Weinschenkite from Nitzelbuch mine, Auerbach, Bavaria [M.A. **2**–522], ha a unit cell a 6·48, b 15·12, c 6·28 Å. ($a:b:c$ = 0·429:1:0·415), β 50° 36′ ± 30′ containing 4[(Yt,Er)$PO_4.2H_2O$]; space-group $C_{2h}^6 = A2/a$(?), sp. gr. 3·10. Thes data are compared with previously determined values for gypsum [M.A. **4**–158 **6**–413] which in a new orientation are a' 6·51, b 15·15, c' 6·28 Å. ($a:b:c$ = 0·430:1:0·415), β 52° 36′, containing 4[$CaSO_4.2H_2O$]; space-group C_{2h}^6.

L. J. S.

Strunz (H.). *Isotypie der Verbindungen $PbK_2[SO_4]_2$ und $Ca_3[PO_4]_2$.* Naturwiss. 1942, vol. 30, p. 242.

Palmierite [M.A. **1**–216] has a unit cell a 5·48, c 20·61 Å. (c/a 3·761), a 7·56 Å., α 42° 28′, containing three molecules $PbK_2(SO_4)_2$, symmetry D_{3d}(?). These values are compared with those of whitlockite [M.A. **8**–99; for c 39·9 Å. read c 36·9 Å.] the unit cell of which contains $24Ca_3(PO_4)_2$. L. J. S.

Strunz (H.). *Isotypie unter Besetzung vakanter Gitterorte. $Fe''_2[PO_4]_2.4H_2O$ und $Fe''_3[PO_4]_2.4H_2O$.* Naturwiss., 1942, vol. 30, p. 531.

The cell dimensions a 10·60, b 5·09, c 17·76 Å., β 89° 32′, of phosphorophyllite ($(Fe'',Zn)_3(PO_4)_2.4H_2O$) from Hagendorf, Bavaria, are approximately double or half of the corresponding values for phosphosiderite ($Fe'''PO_4.2H_2O$) [M.A. **7**–495, 508]. Lines in the powder photographs show nearly the same spacings but with different intensities. It is suggested that 4Fe‴ or 6Fe″ occupy positions (with some vacant spaces) in the same PO_4 and H_2O framework. L. J. S.

Martinez Strong (Pablo). *Clasificación de los silicatos naturales con arreglo a su estructura cristalina.* Bol. R. Soc. Española Hist. Nat., 1942, vol. 40, pp. 37–56, 4 figs.

A classification of silicate minerals based on the arrangements of the SiO_4 groups of W. L. Bragg [M.A. **6**–58], giving the chemical formula and crystalline system of each mineral. L. J. S.

Machatschki (F.). *Zur Frage der Stabilität des Zirkongitters.* Zentralblatt Min. Abt. A, 1941, pp. 38–40.

In the zircon structure each Si is surrounded by four oxygens and each Zr by

t oxygens, but the distances Zr–O are irregular [four at 2·05 and four at Å.]. These distances lie between the limits of 8- and 6-coordinations, the r of which is more usual in Zr compounds. The structure is consequently able, and zircon cannot readily be prepared artificially. In the isomorphous otime, with a larger yttrium atom, all distances Yt–O are nearly the same. otime is strongly radioactive, is not found in the metamict state, and it is ily prepared artificially. L. J. S.

ANIEL (H.) & TSCHEISCHWILI (L.). *Zur Struktur von K_2BeF_4, Sr_2SiO_4 und Ba_2SiO_4.* Zeits. Krist., 1942, vol. 104, pp. 348–357, 2 figs.

hin pseudo-hexagonal plates of K_2BeF_4 with the forms (001), (110), (111),), (021), and (011) yield *a* 5·693±0·003, *b* 9·896±0·004, *c* 7·27±0·01 Å. with -cell contents $4K_2BeF_4$, space-group *Pnma* = D_{2h}^{16}, crystal-structure of the O_4 type. The cell dimensions and the specific gravities of the compounds SiO_4 and Sr_2SiO_4, also isostructural with K_2SO_4, are: *a* 5·76±0·02, *b* 10·17± , *c* 7·56±0·03 Å., sp. gr. 5·419; *a* 5·59±0·03, *b* 9·96±0·05, *c* 7·262±0·001 Å., gr. 4·506. Cell dimensions are also given for various mixed crystals between um and strontium silicates and indexed powder data for K_2SO_4, K_2BeF_4, SiO_4, and Sr_2SiO_4. F. A. B.

UNZ (H.). *Steenstrupin, ein Silikat vom Formeltypus Apatit.* Naturwiss., 1942, vol. 30, p. 65.

he unit-cell dimensions of steenstrupine (*a* 9·47, *c* 15·39 Å., F. Machatschki, 1) show a similarity to those of apatite, and the formula is written as $(OH,F)|(SiO_4)_3]$ to correspond with that of apatite $Ca_5[F|(PO_4)_3]$. L. J. S.

STRÖM (Anders). *The crystal structure of cordierite.* Arkiv Kemi, Min. Geol. Stockholm, 1942, vol. 15B, no. 12, 7 pp., 2 figs.

Rotation photographs about [100] and [010] of cordierite from Risør, Norway, e a unit cell *a* 17·03, *b* 9·67, *c* 9·35 Å. containing $4Mg_2Al_4Si_5O_{18}$, calculated 54; space-group D_{2h}^{20}= *Cccm*. The pseudo-hexagonal structure is similar to t of beryl with channels parallel to the *c*-axis. Non-essential water is placed hin these channels. [M.A. **4**–109, 198.] L. J. S.

BERG (Erik R.). *On the structure of barylite.* Geol. För. Förh. Stockholm, 1942, vol. 63 (for 1941), pp. 394–404, 3 figs.

— *Barylite in relation to other similar silicates.* Ibid., pp. 405–412.

ingle crystal and powder X-ray photographs of barylite from Långban yield nit cell containing $4Be_2BaSi_2O_7$ with *a* 9·79, *b* 11·61, *c* 4·63 Å., space-group bably D_{2h}^{16} = *Pnma*. The crystal-structure is fairly close-packed and probably tains Si_2O_7 groups. The relationship of barylite to other silicates of the general mula $R'_6Si_2O_7$ is considered and there is some similarity in type of formula unit-cell dimensions to hemimorphite. F. A. B.

AUMANIS (M.) & ENCE (E.). *Die Konstruktion des räumlichen reziproken Gitters monokliner Kristalle. Die Raumgruppen der Oxalsäure $(COOH)_2.2H_2O$ und des Kaliumchlorats $KClO_3$.* Zeits. Krist., 1942, vol. 104, pp. 375–384, 5 figs.

Detailed constructions of the reciprocal lattice for monoclinic crystals.
F. A. B.

Meteorites.

Leonard (Frederick C.) & Slanin (Boris). *Statistical studies of the meteoritic fa of the world: 3. Their time distribution.* Popular Astronomy, Northfiel Minnesota, 1941, vol. 49, pp. 551–560, 5 figs.; Contr. Soc. Res. Meteorit [1942], vol. 2 (for 1941), pp. 309–318, 5 figs. [M.A. 8–189.]

Tabulations and graphs are given for 1314 (21 earlier than 1790) observed a unobserved falls according to year, month, day, and hour. Since 1833 there h been at least one record each year, and the maximum of observed falls is 15 1933. Of 581 observed falls there is a maximum of 69 in May; and of 469 o served falls 317 occurred between noon and midnight. [M.A. 6–388; 7–65, 6 171, 173.] L. J. S.

Leonard (Frederick C.). *Statistical studies of the meteoritic falls of the worl 4. Their classificational distribution.* Popular Astronomy, Northfield, Minn sota, 1943, vol. 51, pp. 44–49.

—— *5. The observed sideritic and siderolitic falls.* Ibid., pp. 161–167. [M.A 8–189.]

A compilation from A. L. Coulson's catalogue of 1258 meteorites [M.A. 8–5 giving the number and percentage of meteorites known in each of 76 classes (f which some new symbols are suggested), together with mention by name some representative falls. Observed falls of siderites and siderolites are listed a authentic (38), doubtful or improbable (18), and recently reported requirin confirmation (7). L. J. S.

Leonard (Frederick C.). *Some symbols recommended for use in the classificatio of meteorites etc.* Popular Astronomy, Northfield, Minnesota, 1943, vol. 5 pp. 222–223.

Various modifications of the symbols of the Rose-Tschermak-Brezina classifica tion are suggested. L. J. S.

La Paz (Lincoln). *Meteorite detectors.* Popular Astronomy, Northfield, Minnesot 1942, vol. 50, pp. 157–165, 3 figs.

Wisman (Franklin Otis). *Synthetic symmetry in mutual-induction balances: practical problem with meteorite detectors.* Ibid., pp. 215–222, 7 figs.

There must be many more buried meteorites than those that have been turne up during ploughing. Several forms of electromagnetic detectors (some designe for finding unexploded bombs) are described; and with one of these 13 masses o meteoritic iron (the largest estimated at 300–500 lb. at a depth of over three fee in limestone) were quickly located at the Odessa meteorite crater, Texas. [M.A 7–274.] L. J. S.

Foshag (W. F.). *Breve estudio de los meteoritos.* Mem. Soc. Cubana Hist. Nat. 1942, vol. 16, pp. 3–11.

Translation of presidential address. [M.A. 8–188.] L. J. S.

Nininger (H. H.). *Trends in meteoritics.* Sky and Telescope, Harvard Colleg Observatory, Cambridge, Mass., 1942, vol. 1, no. 8, pp. 6–8, 7 figs.

A general article with reference to the relation to astronomy and geology

strations are given of the use of a magnetic balance for locating buried eorites and of a magnetic rake towed by a motor-car for collecting small allic fragments from the soil. An aerial photograph is given of a problematical eorite crater (350 × 250 feet across and 29 feet deep) discovered in 1941 near stone, Colorado, in which a magnetometer survey has indicated the presence wo magnetic masses. L. J. S.

INGER (H. H.). *Cataclysm and evolution.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 270–272.

he encounter of planetoids with the earth is suggested as the cause of geo- al revolutions and the extinction of faunas and floras. Many planetoids are wn between Mars and Jupiter, and it is likely that there are others nearer earth than Hermes. L. J. S.

DDHUE (John Davis). *The compressive strength of meteorites.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 390–391.

he crushing strength of eight stones was determined. Holbrook yielded at 63, ert at 768, and Ness County at 844 kg./cm.^{2} These falls were of showers of 000, 10, and 25 stones respectively; other stones crushing at 1627–3810 kg./cm.^{2} as a single mass. There is thus a relation between the compressive strength d the detonation of meteorites due to air pressure. L. J. S.

DDHUE (John Davis). *Nitrogen and its compounds in meteorites.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 560–563.

Nitrogen [Graham, 1867], cyanogen [M.A. **8**–56], and titanium nitride [Min. g. **26**–36] have been detected in meteorites. Ammonia was extracted by water m eight meteoritic stones, and in Holbrook the amount was determined as H_3 0·0033 % (not all soluble in water and the state of combination not known). nitrate or nitrite was detected. It is suggested that the nitrogen found by B. Lipman [M.A. **5**–296] was from ammonia. L. J. S.

DDHUE (John Davis). *Some soluble constituents of meteorites.* Amer. Min., 1941, vol. 26, pp. 677–680.

Records are collected from the literature of water-soluble salts ($FeCl_2$, CaS, Cl_2, $CaSO_4$, $MgCl_2$, $MgSO_4$, MgS_2O_3, Na_2S, NaCl, Na_2SO_4, $Na_2S_2O_3$, $NiSO_4$, SO_4, SiO_2), of oldhamite, and of free sulphur, present in meteorites. Several ony meteorites digested with boiling distilled water yielded Ca, Cl, PO_4, SO_4; aphite from siderites yielded Fe, Ni, Cl; and troilite from a siderite gave SO_4. ee sulphur was found in small amounts in stones and in the graphite and oilite of siderites. L. J. S.

RINOV (E. L.) Кринов (Е. Л.). *A tentative spectrophotometrical classification and scale for grading stony meteorites.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1940, vol. 27, pp. 563–564.

The usual colour scale for meteoritic stones—black, dark grey, grey, pale grey, hite—is very approximate and arbitrary. An examination of 40 stones [M.A. -172, 266] shows that reflecting power depends on brightness and also on the lour, ranging from 0·04 (violet)–0·05 (red) for the darkest meteorite (Boriskino) 0·44 (violet)–0·59 (red) for the lightest (Białystok). Five classes are graded

according to reflecting power and each subdivided into four types accordir to the ratio of the reflecting power at the red and violet ends of the spectru The direct determinations are, however, difficult and require special apparatu so a colour scale of these twenty divisions has been made with mixtures of bary and coal, against which freshly broken surfaces of meteorites can be matched. L. J. S.

Johnson (W. W. A.) & Norman (Daniel P.). *A spectrographic study of meteorite* Astrophysical Journ., Chicago, 1943, vol. 97, pp. 46–50.

In 18 meteorites examined for 69 elements the following 40 were found: Ag, A As, Au, Ba, Be, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Hg, In, Ir, K, Li, Mg, Mn, M Na, Ni, P, Pb, Pd, Pt, Ru, Sb, Se, Si, Sn, Sr, Te, Ti, Tm, V, Zn, Zr. No obviou grouping could be made on the basis of the presence of minor elements, but tw irons contained less Ti than the stones. [M.A. 6–391.] L. J. S.

[Vernadsky (V. I.)] Вернадский (В. И.). О необходимости организованно научной работы по космической пыли. [*On the necessity of organizatio of scientific study of cosmic dust.*] Проблемы Арктики [Problems of th Arctic, Arctic Inst., Leningrad], 1941, no. 5, pp. 55–64.

Proposals are made for organizing the systematic collection of cosmic dust i oceanic and lacustrine sediments and in snow at high altitudes, and for systematic study of its distribution, nature, and composition. It is suggeste that, besides dispersed cosmic dust, there may be clouds of dust, some of whicl may be associated with meteorites. These clouds colliding with the earth ma produce craters similar to meteorite craters. The following falls are suggested a possibly due to cosmic dust clouds: Tunguska, 1908 [M.A. 8–192]; Canyon Diablo Arizona; Tazovskaya Guba fall of September 18, 1938 in NW. Siberia (67° 28′ N. 78° 44′ E.), described by V. N. Andreev (Priroda, 1940, no. 2, p. 62) as a 'mysteri ous eclipse'. S. I. T.

Wilson (Ben Hur). *Meteoritic fossils.* Popular Astronomy, Northfield, Minne sota, 1942, vol. 50, pp. 125–128.

Charles Lyell (1855) is quoted at some length on the improbability of meteorites that have fallen in the sea being preserved in sedimentary rocks. Mention is made of the siderite weighing 17½ lb. found in 1841 at a depth of 31½ feet, associated with remains of mammoth and rhinoceros, in the Petropavlovsk gold washings, Siberia. L. J. S.

Rojansky (V.). *Cosmic rays and comets.* Physical Rev. (Amer. Phys. Soc.), 1940, vol. 58, p. 1010.

Some consequences of the author's suggestion that comets are 'contraterrene' bodies (that is, composed of atoms consisting of a negative nucleus surrounded by positrons) are discussed. [M.A. 8–62, 191.] M. H. H.

Rayleigh (*Lord*). *The stone-iron meteorites called pallasites: a synthetic study of their structure and probable mode of origin.* Proc. Roy. Soc. London, Ser. A, 1942, vol. 179, pp. 386–393, 2 pls., 1 text-fig.

The gross structure of pallasites is simulated by pouring molten solder into a packed mass of angular or rounded fragments of steatite. Nickel-iron (which has a lower melting-point than olivine) is considered to be of later introduction in pallasites. L. J. S.

ODHUE (John Davis). *More about age of meteorites.* The Mineralogist, Portland, Oregon, 1941, vol. 9, pp. 375, 386.

urther review with criticisms of recent literature. [M.A. 8–56, 190.]

L. J. S.

OL (W. J.), JACOBI (R. B.), & PANETH (F. A.). *Meteorites and the age of the solar system.* Nature, London, 1942, vol. 149, pp. 235–238.

ew determinations of U, Th, and He in six siderites give ages 75–6800 million rs. From helium determinations for 50 siderites, assuming average activity, s range from <0·11 to 6800 million years. Discordant results are obtained for erent masses of Cape York and Gibeon. The higher value is compared with ut estimates of the age of the solar system. L. J. S.

FMANN (Josef). *Direkte Uran- und indirekte Radiumbestimmung an einer Probe des Elbogener Eisenmeteoriten.* Zentralblatt Min., Abt. A, 1941, pp. 31–37.

Early analyses of the Elbogen (Bohemia, fell about 1400) siderite have shown 2·47–8·75 %. A new analysis gave Fe 90·77, Ni 7·51, Co 0·82, Cu? 0·006, 0·32, insol. 0·10 = 99·52, also traces Ti, S, Al, Mn, Ca, Mg, and probably metals. C, Na; sp. gr. 7·867. The separated uranium was taken up with F and the amount estimated by the strength of the fluorescence, giving $9{\cdot}18 \times 10^{-6}$ %; and from the U/Ra ratio is calculated Ra $3{\cdot}06 \times 10^{-12}$ %.

L. J. S.

PAZ (Lincoln). *J. G. Galle on the Pultusk, Poland, meteoritic shower.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 441–442.

LLE (J. G.) (1812–1910). *Concerning the meteor observed on January 30, 1868, which fell through the atmosphere as a shower of stones at Pultusk in the kingdom of Poland.* Translated by Walter H. Haas. Ibid., pp. 442 449, 501–509.

A full translation is given of Galle's paper published in 1868 in 45th Jahresber. Abhandl. Schlesischen Gesell. Vaterländ. Cultur, Breslau, giving particulars the fall of the Pultusk meteorite and calculation of its path. L. J. S.

TROPOLSKY (B. S.) Митропольский (Б. С.). *The "Bolshaya Korta" stony meteorite.* Compt. Rend. Acad. Sci. URSS, 1940, vol. 28, pp. 120–121.

A somewhat oxidized stone was ploughed up in 1939 near Bolshaya Korta llage (57° 38′ N., 83° 22′ E.), Narym, Novosibirsk. It was estimated to weigh $2\frac{1}{2}$ kg., but several fragments were broken off and lost; the main mass of 93 grams was delivered to the Academy of Sciences. [M.A. 8–192.]

L. J. S.

HRISTIE (William H.). *The great Siberian meteorite of 1908.* Griffith Observer, Los Angeles, California, 1942, vol. 6, pp. 38–47, 7 figs.

A general popular account. [M.A. 8–192.] L. J. S.

ATES (Frank). *A record of the meteorites of Tanganyika Territory.* Tanganyika Notes and Records, 1941, no. 12, pp. 28–31, 1 pl.

Mbosi, siderite, 12–15 tons [Min. Mag. 22–487; M.A. 5–154, 6–396]. Peramiho, ucrite, fell October 24, 1899 [described by F. Berwerth, 1903]. Ivuna, carbonaceous

chondrite, fell December 16, 1938 [M.A. 8–58]. Malampaka, olivine-enstatite chondrite with blebs of nickel-iron, fell with a loud rumbling noise out of a clear sky about midday in September (?), 1930, one mile west of Malampaka railway station [3° 8′ S., 33° 31′ E., Mwanza district]; fragment weighing 455 grams in the Geological Survey Museum at Dodoma. L. J. S.

Shand (S. J.). *The Witsand meteorite, South-West Africa.* Amer. Journ. Sci. 1942, vol. 240, pp. 67–71.

At about 5 p.m. on December 1, 1932, a stone (or perhaps a shower of stones) fell on Witsand farm (28° 40′ S., 18° 55′ E.) in Warmbad district. Only a fragment of 79·5 grams was received. It is a friable white chondrite very similar to Soko Banja, with chondrules of hypersthene and olivine in a groundmass of blades of hypersthene ($2V_\alpha$ 80–82°) and grains of olivine ($2V_\alpha$ 80–88°). A partial chemical analysis gave olivine (Mg : Fe = 3 : 1) 47, hypersthene (Mg : Fe = 4 : 1) 43, nickel-iron (Fe : Ni = 12 : 1) 9·7 %, which is very similar to the average value for chondrites. L. J. S.

Doll (Charles G.). *A meteorite from Vermont.* Science, New York, 1942, vol. 96 p. 494.

A siderite weighing 5 lb. 2 oz. was found in August 1942 on the surface of Whitcomb Hill [43° 51′ N., 72° 21′ W., in Orange Co.]. A polished and etched surface shows microscopic Widmanstetter figures. This is the first meteorite to be recorded from Vermont, and is named South Strafford from the nearest village. L. J. S.

Keeley (Frank J.). *The Black Moshannon Park aerolite.* Notulae Naturae, Acad. Nat. Sci. Philadelphia, 1942, no. 99, 4 pp., 2 figs.

A stone weighing 523·86 grams fell with a loud noise four feet from a tent in Black Moshannon State Park (40° 55′ N., 78° 5′ W.), Center Co., Pennsylvania, between 6 and 6.30 a.m. (E.S.T.) on July 10, 1941. Part of the surface shows a slight secondary crust. It is a crystalline spherical chondrite, similar to Holbrook; sp. gr. 3·48. L. J. S.

Henderson (E. P.) & Cooke (C. Wythe). *The Sardis (Georgia) meteorite.* Proc. U.S. Nat. Mus., 1942, vol. 92, no. 3143, pp. 141–150, 2 pls.

A much weathered siderite weighing 1740 lb. (800 kg.) was found in 1940 when ploughing at 32° 56′ 56″ N., 80° 51′ 54″ W., in Jenkins Co., $6\frac{1}{4}$ miles WSW. of Sardis in Burke Co. It is a coarse octahedrite with very little taenite, troilite, and schreibersite. Analysis gave Fe 92·08, Ni 6·69, Co 0·47, P 0·24, S trace, total 99·48. Fragments of iron-shale (20 lb.) were also found. Arguing that a mass of this size (the sixth largest found in U.S.A.) would have penetrated to a greater depth than that reached by the plough, and from the rate of denudation of the ground surface, it is suggested that this meteorite perhaps fell in Miocene times. Shallow depressions and elliptical 'bays' in the neighbourhood have no connexion with this meteorite. L. J. S.

Nininger (H. H.). *The Enon, Ohio, meteorite (mesosiderite).* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 563–565, 1 fig.

A stone weighing 763 grams was picked up about 1878 at Enon in Clark Co.

52′ N., 83° 57′ W.]. A polished section shows a patchy distribution of metal sulphide grains in about equal amounts. L. J. S.

SON (Ben Hur). *The Bucyrus (Ohio) meteorite hoax.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 274–276.

newspaper account in 1875 of a meteorite 'the size of a bucket' passing ugh a man has often been repeated; but the details as given are not con- nt. There is no authentic record of a human being killed by a meteorite. L. J. S.

DERSON (E. P.) & PERRY (Stuart H.). *The Freda, N. Dak., meteorite: a nickel-rich ataxite.* Proc. U.S. National Museum, 1942, vol. 92, no. 3134, pp. 21–23, 4 pls.

oriented siderite with well-marked flow-lines and weighing 268 grams was ghed up in 1919 near Freda (46° 23′ N., 101° 14′ W.). It shows an acicular ensitic structure in which are scattered spindles of kamacite with phosphide sions and surrounded by taenite. Analysis gave Fe 75·86, Ni 23·49, Co 0·66, 15, S trace, insol. 0·07. L. J. S.

NIG (Oscar E.). *The Schertz, Guadalupe County, Texas, meteorite proved identical with Canyon Diablo, Arizona.* Popular Astronomy, Northfield, Minnesota, 1941, vol. 49, pp. 560–562; Contr. Soc. Res. Meteorites, [1942], vol. 2 (for 1941), pp. 318–320.

piece of 308 grams in G. F. Kunz's collection and one of 175 lb. at Yorktown, as, closely resemble the Canyon Diablo siderite. They came from a consign- nt of several hundred pounds which was abandoned about 1893 at the way station of Schertz, the freight charges not having been paid. L. J. S.

RD (J. O.). *Metal structures in Odessa, Texas, and Canyon Diablo, Arizona, meteorites.* Popular Astronomy, Northfield, Minnesota, 1941, vol. 49, pp. 493–500, 14 figs.; Contr. Soc. Res. Meteorites, [1942], vol. 2 (for 1941), pp. 298–305, 14 figs.

The various structures, Widmanstetter figures, Neumann (twin) bands, strain s, slip bands, and veins, shown on sections of the Odessa and Canyon Diablo erites are compared with those of iron and steel. Under high magnification a t in the Odessa siderite showed a laminated structure similar to 'oxide- rlite' [Min. Mag. **24**–620]. Ferrite and austenite, the α- and γ-phases of steel, respond with kamacite and taenite respectively. L. J. S.

DDHUE (John Davis). *A new aerolite from Stonington, Colorado.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 97–99.

The Stonington meteorite: new find described. The Mineralogist, Portland, Oregon, 1942, vol. 10, pp. 377–378.

A much weathered but crusted stone weighing about 6 lb. was found some years o on a farm near Stonington [37° 16′ N., 102° 16′ W.] in Baca Co. It is a veined rystalline chondrite containing soluble silicate 42·35, insoluble silicate 37·55, tal+troilite 19·67, moisture 0·36 %. The metal and troilite together gave 94·37, Ni 5·57, Co+Cu 0·237 %. Gases include CO, Ne, and probably CN. nish-white, green, and red specks of fluorescence are shown in cathode rays. L. J. S.

Pruett (J. Hugh). *The case of the Willamette.* Sky and Telescope, 1943, vol. no. 7, pp. 6–7, 4 figs.

A popular account of the finding and removal of the Willamette, Orego meteorite, and of the ensuing lawsuit. [M.A. **7**–379.] L. J. S.

Pruett (J. Hugh). *The Portland meteor and resulting meteorite.* Astronomic Society of the Pacific, San Francisco, 1942, Leaflet no. 165, 8 pp., 1 fig. (map

A popular account of the fall of the Washougal, Washington, meteori [M.A. **7**–544] at 7.35 a.m. P.S.T. on July 2, 1939. The path was W.–E. and th estimated velocity 35–40 miles per second. A stone (howardite) weighin 225 grams was found. L. J. S.

Henderson (E. P.). *El Burro, Coahuila, Mexico, meteorite.* Amer. Min., 194 vol. 26, pp. 655–656, 1 fig.

A 79-lb. siderite was found in 1939 near El Burro hills (29° 20′ N., 101° 50′ W. Sections show large (8·5 × 3 cm.) areas of kamacite with some schreibersit between, but very little taenite. The nickel percentage (Fe 93·10, Ni 6·0 Co 0·34, P 0·32, S trace, insol. 0·01 = 99·79) shows that it is just within th $\alpha+\gamma$ iron field, and it is classed as a very coarse octahedrite. The so-calle brecciated hexahedrites probably belong to this group of octahedrites. L. J. S.

Nininger (H. H.). *The aerolitic fall of Rancho de la Presa, Zenapecuaro, Michoa can, Mexico.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 5(pp. 388–389, 1 fig.

This stone of over 300 grams was seen to fall in 1899. It is probably a brecciate veined grey chondrite with grains of nickel-iron. The main mass is in the Stat Museum at Morelia, 63 grams in Mexico City, and 3 grams in Chicago. L. J. S.

Vidal (Ney). *Meteoritos Brasileiros.* Bol. Museu Nac. Rio de Janeiro, 193(vol. 12, nos. 3–4, pp. 91–109, 8 pls.

A review is given of the literature of Brazilian meteorites represented in th National Museum at Rio de Janeiro. They include the siderites Bendeg (5360 kg.) and Santa Luzia de Goyaz [M.A. **7**–545]; five stones, Santa Barbara Itapicurú-mirim, Macau, Angra dos Reis, and Uberaba; and fragments of th Santa Catharina iron which is considered not to be meteoritic. A map shows th localities of ten Brazilian meteorites. [Min. Mag. **22**–280.] L. J. S.

Herrero Ducloux (Enrique). *Nota sobre el meteorito de San Carlos (provincia d Buenos Aires).* Notas Mus. La Plata, 1942, vol. 7, Geol. no. 19, pp. 123–12 2 figs.

A fragment weighing 3600 grams of a much larger stone found [when?] in th surface soil on the San Carlos estate [35° 32′ S., 58° 46′ W.], Monte district, ha sp. gr. 3·539–3·540, and a bulk composition (from analyses of portions solub and insoluble in HCl) similar to that of the Pultusk meteorite. SiO_2 36·2 TiO_2 trace, Al_2O_3 4·50, Cr_2O_3 0·40, Fe_2O_3 0·45, FeO 12·89, NiO 0·91, CoO 0·0 MnO 2·12, SnO_2 0·53, MgO 22·43, CaO 1·80, Na_2O 0·135, K_2O 0·084, SO_3 trac P_2O_5 trace, Fe 13·25, Ni 1·90, Co 0·08, Mn 0·11, S 1·51, P 0·08 [= 99·519]. L. J. S.

ORDON (Samuel G.). *Results of the Chilean mineralogical expedition of 1938. Part VI.—Another hexahedrite (iron meteorite) from northern Chile.* Notulae Naturae, Acad. Nat. Sci. Philadelphia, 1942, no. 97, 3 pp., 2 figs. [M.A. 8–187.]

A siderite of 78 kg. purchased in Antofagasta was said to have been found near uillagua. The under surface shows concavities due to weathering, and the upper rface is pitted by sand-blasting. The kamacite mass contains inclusions of ilite, schreibersite, and rhabdite. Analysis by P. Collins gave Fe 93·53, Ni 5·48, 0·62, P 0·21, S 0·05 = 99·89. sp. gr. 7·699. This is the largest mass of the 'orth Chilean' hexahedrites [M.A. 8–196]. L. J. S.

WARDS (A. B.) & BAKER (G.). *The Pakenham meteorite.* Proc. Roy. Soc. Victoria, 1942, new ser., vol. 54, pp. 7–16, 2 pls.

A mass coated with iron-shale, weighing 89 lb., was found at a depth of 3 feet 1928 during road-making near Pakenham [38° 5′ S., 145° 24′ E.] in Mornington ., Victoria [40 miles SE. of Melbourne]. It is a nickel-poor coarse octahedrite, ry similar to other masses of the Cranbourne fall, and was found along the me nearly straight line as these. Disintegration of the mass has proceeded pidly since 1928, and after removing scale and cutting (with an oxy-acetylene me!), the present weight is $56\frac{1}{2}+1\frac{1}{4}$ lb. The polished surface soon rusts, nless protected. Analysis of clean shavings, free from pyrrhotine and graphite, ve: Fe 92·31, Ni 6·81, Co 0·54, Cu nil, P 0·37, S nil, C n.d., Cl n.d., insol. l = 100·03, sp. gr. 7·927 ; Fe : Ni = 13·5. The mass consists mainly of kamacite ith little taenite as narrow lamellae interleaved in the kamacite. Nodules con- st of a core of pyrrhotine (rather than troilite [M.A. 8–196, 197]) sometimes rrounded by graphite and an outer zone of phosphides. Four kinds of Fe-Ni hosphides are distinguished by etching tests—rhabdite, schreibersite, schreiber- te B, and yellow phosphide. Daubreelite(?) occurs in the pyrrhotine. Lawrencite nd probably nickel chloride are present. Oxidation products are limonite and evorite. L. J. S.

ODGE-SMITH (T.) & CHALMERS (R. O.). *The Moorleah meteorite.* Rec. Queen Victoria Museum, Launceston, Tasmania, 1942, vol. 1, pp. 13–16, 1 pl.

A stone weighing 8887·5 grams ($19\frac{1}{2}$ lb.), sp. gr. 3·51, was observed to fall about .30 p.m. in October 1930 at Moorleah (40° $58\frac{1}{2}$′ S., 145° 36′ E.) near Wynyard. his is the first observed fall and the first stone to be recorded from Tasmania, hence three siderites are previously known. It is an enstatite-olivine-chondrite. he bulk composition, SiO_2 40·39, Al_2O_3 2·81, Fe_2O_3 0·23, FeO 14·13, MgO 25·89, aO 1·49, Na_2O 1·32, K_2O 0·04, H_2O 0·05, FeS 6·27, Fe 6·68, Ni 0·89, Co 0·03, nO, P, Cl traces = 100·22, corresponds to olivine ($2Mg_2SiO_4.Fe_2SiO_4$) 52·67, nstatite (iron-free) 20·52, felspar 12·67, FeS 6·72, nickel-iron (Fe : Ni = 7·2 : 1) ·60, limonite 0·08 %. L. J. S.

HODGE-SMITH (T.). *Interesting meteorite additions to the museum collections.* Australian Mus. Mag., 1942, vol. 7, pp. 429–430.

Tawallah Valley eotaxite [M.A. 8–196], $66\frac{1}{2}$ lb. in the Australian Museum at ydney and $86\frac{3}{4}$ lb. in the Geological Survey collection at Canberra. Moorleah preceding abstract], $\frac{1}{4}$ lb. in Sydney and the main mass in the Queen Victoria

Memorial Museum at Launceston, Tasmania. Murnpeowie [Min. Mag. 24–13] 2½ lb. in Sydney, from the 2520 lb. mass in Adelaide, which was found in August 1909 by an aboriginal. L. J. S.

Wylie (C. C.). *Calculations on the probable mass of the object which formed Meteor Crater.* Popular Astronomy, Northfield, Minnesota, 1943, vol. 51, pp. 97–99.
—— *Second note . . . .* Ibid., pp. 158–161.
—— *Applying mine-crater formulas to Meteor Crater, Arizona.* Ibid., pp. 220–222.

Previous estimates of the weight of the Canyon Diablo meteorite are much too high, the explosive energy not having been taken into account. From the sizes of military mines it is calculated that to produce a crater the size of the one in Arizona, a charge of 125,000 tons of nitroglycerine would be needed. This amount of explosive energy would be given by a mass of iron of 5000 to 15,000 tons (35–50 feet diameter) entering the earth's atmosphere with an initial velocity of 20–10 miles per second (impact velocity 12·6–7·1 m.p.s.). Revised calculations in the third note suggest a mass up to 25,000 tons. L. J. S.

Sellards (E. H.) & Barnes (Virgil E.). *Progress in excavating the Odessa, Texas, meteorite crater.* (Abstract.) Popular Astronomy, Northfield, Minnesota, 1943, vol. 51, pp. 224–225.

With the help of magnetometer surveys a large meteoritic mass has been found at a depth of 164 feet. Shattered 'rock flour' forms a bed 25 feet thick. Outside the rim of the main crater is a 'craterette', 80 feet across and 23 feet deep, containing about a thousand meteoritic fragments; and other magnetic high points have been located. L. J. S.

Nininger (H. H.). *A possible new meteorite crater in North Africa.* Popular Astronomy, Northfield, Minnesota, 1943, vol. 51, p. 96.

A crater is briefly described from indistinct aerial photographs at 15° 6′ N., 26° 15′ E. [This is the explosion volcanic crater of Malha, Sudan. Geogr. Journ., 1933, vol. 82, p. 116; Quart. Journ. Geol. Soc., 1935, vol. 91, p. 360.] L. J. S.

Johnson (Douglas). *The origin of the Carolina bays.* 1942, New York (Columbia Univ. Press), xii+ 341 pp., 46 figs., Price $4.50.

The theory of a meteoritic origin is rejected, and it is suggested that the shallow oval depressions were formed by a complex combination of artesian, solution, lake, and wind action. [M.A. 5–303, 6–16, 7–274.] L. J. S.

Darling (J. H.). *Meteors and the moon's surface.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 169–170.
Wylie (C. C.). *Meteors and the lunar surface.* Ibid., pp. 268–269.

In the absence of an atmosphere on the moon, even small meteorites (an enormous number of which reach the earth's atmosphere) will strike the surface with explosive violence. It is suggested that this is the cause of the surface covering of fine dust. L. J. S.

Scott (William). *The distribution and probable origin of the lunar craters.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 331–336, 1 fig.

Ray craters on the moon have a random distribution, but the more numerous

cal craters have a non-random one; suggesting that, as on the earth, the ers may be both volcanic and meteoritic in origin. L. J. S.

DWIN (Ralph B.). *The meteoritic origin of lunar craters.* Popular Astronomy, Northfield, Minnesota, 1942, vol. 50, pp. 365–369, 1 pl.

— *The meteoritic origin of lunar structures.* Ibid., 1943, vol. 51, pp. 117–127, 1 fig.

he Mare Imbrium is approximately circular (750×650 miles across) and ating from it are rare elongated craters, grooves, and ridges. It is suggested this is a crater formed by collision with a meteorite of asteroidal dimensions. L. J. S.

INGER (H. H.). *The moon as a source of tektites.* Sky and Telescope, 1943, vol. 2, no. 4, pp. 12–15, no. 5, pp. 8–9, 3 figs.

ifteen varied suggestions as to the origin of tektites are mentioned and each ted. 'Tektites are certainly not meteorites.' It is suggested that they came n the moon, not from volcanoes, but as a result of the explosive fall of eorites. [M.A. **3**–539.] L. J. S.

Miscellaneous.

VSESYAN (S. A.) Мовсесян (С. А.). *Lazulite in the andalusite-sericite-quartz rocks of the Kongur-Alanghez range.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 31–32.

Metasomatic 'quartzites' at the contact of granitoid rocks intrusive into phyrites in Transcaucasia contain andalusite, sillimanite, corundum, diaspore, ; and at some places small grains of lazulite with α' 1·621, β' 1·625, γ 1·634, 70°, analysis by I. M. Shumilo, P_2O_5 46·66, Al_2O_3 32·58, Fe_2O_3 0·53, FeO 1·38, O 0·03, MgO 12·10, CaO nil, SiO_2 0·04, TiO_2 0·40, loss on ignition 6·25 = 99·97. L. J. S.

ORENSKY (V. P.) Флоренский (В. П.). *Fluorite in the Lower Permian deposits of the Bashkir Autonomous Socialist Soviet Republic.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 251–254, 1 fig.

Small grains of fluorite were detected in the heavy residues from the dolomite, hydrite, and gypsum rocks of the Tuimasa oil deposit, 150 km. west of Ufa. is and the accompanying celestine were presumably deposited from concen- ted sea-water. L. J. S.

RTUSHKOV (G. N.) Вертушков (Г. Н.). *Pickeringite and ferropickeringite—minerals of the pyrite conflagrations in the Urals.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 30, pp. 334–336.

White fibrous pickeringite occurs in large quantities in the Kalata mine; 1·479, $\gamma:c$ = 30–36°. White fibrous ferropickeringite [M.A. **7**–418] is abundant the Belorechenk mine associated with α-sulphur and gypsum; sp. gr. 1·79, alysis by N. S. Fedulov gave SO_3 35·28, Al_2O_3 11·07, Fe_2O_3 0·23, FeO 1·65, O 0·12, MgO 3·95, H_2O 47·00 = 99·30, corresponding with $(Mg,Fe)Al_2(SO_4)_4$·H_2O, with FeO/(MgO+FeO)>1/4, i.e. >25 % of the halotrichite molecule. ese minerals have been formed by the action of sulphurous vapours on the artz-sericite- and chlorite-schists. L. J. S.

[Borneman-Starynkevich (I. D.) & Belov (N. V.)] Борнеман-Старинкевич (И. Д.) и Белов (Н.) Borneman-Starinkevitch (I.) and Belov (N.). *Isomorphous substitutions in carbonate-apatite.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1940, vol. 26, pp. 804–806, 2 figs.

Analyses of carbonate-apatite plotted with the ratio Ca/P against CO_2 % fall near the series $Ca_{10}P_6O_{24}F_2$–$Ca_{10}C_6O_{18}F_8$, with the extreme substitution of C for P at $Ca_{10}P_5CO_{23}F_3$ ($= 5Ca_{10}P_6O_{24}F_2 + 1Ca_{10}C_6O_{18}F_8$). The general formula is given as $xCa_{10}P_6O_{24}F_2 + yCa_{10}P_5CO_{23}F_3$. [M.A. **7**–351.] L. J. S.

[Tolkachevskaya (N.)] Толкачевская (Н.) Tolkachevska (N.). *On a finding of veins of native arsenic near Gutay village of the Chita district.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 30, pp. 832–833.

Shelly native arsenic associated with calcite was met with in fissure veins in amphibolite when sinking a pit for molybdenite-quartz veins at this locality in Transbaikal. L. J. S.

Holmes (Ralph J.). *Relationships of the higher arsenides of cobalt, nickel and iron occurring in nature.* Science, New York, 1942, vol. 96, pp. 90–92.

Artificially prepared orthorhombic diarsenides have the same X-ray pattern and characters in reflected light as the natural minerals löllingite, rammelsbergite and pararammelsbergite. 'Safflorite' could be prepared only with some iron, and it has the same X-ray pattern as löllingite; it is therefore called cobalt-löllingite. The cubic diarsenides, smaltite, chloanthite, and arsenoferrite could not be prepared; the materials obtained have the same X-ray pattern as skutterudite. The natural minerals also have the X-ray pattern of skutterudite, and they are referred to skutterudite, nickel-skutterudite, and iron-skutterudite respectively with the composition $(Co,Ni,Fe)As_3$. The old analyses range from RAs to RAs_3 due to intergrowth with niccolite, &c. [M.A. **3**–525; **8**–4, 8.] L. J. S.

Nichols (J. B.). *Michigan copper arsenides and historical mineralogy.* The Mineralogist, Portland, Oregon, 1942, vol. 10, pp. 113–114, 128–129.

A description of a suite of minerals—domeykite, algodonite, whitneyite—in the author's collection. The three minerals form a series of complex intergrowths and are deposited in the order mentioned, each mineral in turn being replaced by one with a higher copper content. The last phase of deposition is native copper. Algodonite has been shown to have two constituents α- and β-algodonite, while whitneyite has four, α-, β-, γ-, and δ-whitneyite. These may be distinguished by microchemical and etch-tests. Mention is also made of the Ni- and Co-bearing mohawkite. J. M. S.

Koritnig (Sigmund) & Ehrlich (Ernst). *Dolomitzwillinge aus dem Höllgraben bei Werfen.* Zentralblatt Min., Abt. A, 1940, pp. 41–47, 4 figs.

Large clear crystals of dolomite occur with gypsum and fluorite in veins in Werfen beds and Muschelkalk at this locality (well known for wagnerite and lazulite). They show the forms *r c* with other small rhombohedra, and are twinned on $(10\bar{1}0)$; *rr* 73° 45′. Analysis gave CaO 30·15, MgO 21·19, FeO 1·09, MnO 0·07, CO_2 47·68, total '100·08'. L. J. S.

FMANN (Josef) & MATSCHAK (Gustav). *Über europiumführende Mineralien in granitischen Gesteinen des westlichen Sudetengaues.* Zentralblatt Min., Abt. A, 1940, pp. 78–88, 1 fig.

thoclase phenocrysts in some specimens of granite from Elbogen in Bohemia a blue fluorescence in ultra-violet rays, while other specimens do not esce. In both, however, the extracted rare-earths give the blue fluorescence ropium. The non-fluorescent material after heating in a reducing atmosphere s a faint fluorescence. It is suggested that owing to deep-seated weathering has been changed to Eu''', accompanying the change of Fe'' to Fe'''. In the re veins fluorite is the fluorescent mineral. L. J. S.

NER (Heinz). *Langit aus Cornwall und von Eschach (Schladminger Tauern), Steiermark.* Zentralblatt Min., Abt. A, 1941, pp. 11–17, 4 figs.

ngite from Cornwall with the form of minute scales twinned on (110) giving do-hexagonal groups (like aragonite) has α 1·654, β 1·713, γ 1·722, 2E 66–104°; chroism $\alpha(=c)$ light yellowish-green, β blue-green, $\gamma(=a)$ sky-blue. Similar rial from Styria, occurring as an efflorescence on quartz-phyllite containing copyrite, gave β 1·714, γ 1·724, *mm* 56° 26′. Previous determinations of cal data had been made on other minerals, and reported occurrences of ous' langite are doubtful. L. J. S.

ITNIG (Sigmund). *Langit und andere sekundäre Haldenbildungen von Virneberg.* Zentralblatt Min., Abt. A, 1941, pp. 154–160, 4 figs.

angite as crusts of scaly twinned star-shaped crystals (β 1·704, γ 1·722, 62°, negative), together with antlerite, a brochantite-like mineral, pisanite, site, malachite, and chessylite, has been found on the dumps of an old copper e at Virneberg near Rheinbreitbach. L. J. S.

LB (Georg) & KLOTSCH (Hans). *Die Kristalltracht des Hochquarzes in minerogenetischer Betrachtung.* Zentralblatt Min., Abt. A, 1941, pp. 66–72, 4 figs.

hree types of high-temperature quartz are distinguished according to the it of the crystals. (1) 'Mayen type', in steam cavities in basic volcanic rocks: p bipyramid $(20\bar{2}1)$ with others to $(50\bar{5}1)$. (2) 'Drachenfels type', in steam ities in acid volcanic rocks: bipyramids $(10\bar{1}1)$ and $(30\bar{3}2)$ with rare $(21\bar{3}2)$. 'Porphyry type', embedded crystals in acid volcanic rocks: bipyramid $(10\bar{1}1)$. L. J. S.

RÓKAY (K. v.). *Über das neue Antimonglanz-Vorkommen von Kisbánya und Borpatak (Siebenbürgen, Kom. Szatmár).* Zentralblatt Min., Abt. A, 1941, pp. 85–90, 2 figs.

tibnite as radiating tufts of crystals occurs with Pb-Zn-Cu ores in the late canic ore veins, and is the last mineral to be deposited. On crystals from sbánya 38 crystal-forms (9 of them new) are noted, but the only terminal form (113). Analysis by G. Vavrinecz gave Sb 71·24, Pb 0·21, Fe 0·15, S 28·33, ol. 0·23 = 100·16. Crystals from Borpatak show only the forms *b m s*. L. J. S.

Himmel (Hans) & Schroeder (Robert). *Kristallmorphologische Untersuchung an saarländischen Mineralien, IX. Calcit, Gips.* Zentralblatt Min., Abt. 1941, pp. 121–122, 1 fig.

Water-clear crystals ($3\frac{1}{2}$ cm. across) of calcite with dolomite and chalcopyri from Frankenholz mine near Neunkirchen are flat rhombohedra $e(01\bar{1}2)$; smaller crystals small faces of $v(21\bar{3}1)$ are also present. Gypsum crystals fro Labach mine near Breitenbach. L. J. S.

Machatschki (F.). *Notiz über die Entwässerung des Turmalins.* Zentralbla Min., Abt. A, 1941, pp. 135–137.

Lilac-red tourmaline from San Diego Co., California, shows very little loss water below 800°. At about 850° a loss of 3·47 % takes place slowly (in 10 hou from the powdered material; more quickly at 1000°. Dehydration of whc crystals is still slower. X-ray powder photographs show that the structure destroyed, suggesting that the water is present as hydroxyl. From an analys by W. T. Schaller (1912) of rubellite from San Diego Co. showing H_2O 3·38 the formula is calculated as $(Na_2Ca)(Li_4Al_{23})B_9Si_{18}(OH,F)_{10}O_{83}$. L. J. S.

Baier (Ernst). *Zur Kristallographie des Lazuliths.* Zentralblatt Min., Abt. 1941, pp. 145–154.

Complex lamellar twinning in lazulite examined in thin sections on th universal microscope stage is ascribed to twinning on [001], (110), (223), (21C (021), and perhaps (101), (111), and $(11\bar{1})$. L. J. S.

Tokody (L.). *Über den Kupferkies, Bournonit und Fahlerz von Felsőbány* Zentralblatt Min., Abt. A, 1941, pp. 166–174, 1 fig.

Goniometric measurements on crystals of chalcopyrite, bournonite, and tetra hedrite show twinning in the first and some new crystal-forms with high indic for the last two. L. J. S.

Kleber (W.). *Bemerkung zur kristallchemischen Beziehung zwischen Pyrit un Hauerit.* Zentralblatt Min., Abt. A, 1941, pp. 177–182.

Pyrite and hauerite are isotypic but not isomorphous. To account for th marked differences in their characters the formulae are written as S_2–Fe–Fe–S and Mn–S_2. L. J. S.

Strunz (H.). *Kristallographie und chemische Formel von Långbanit.* Zentralbla Min., Abt. A, 1942, pp. 133–136, 1 fig.

Flink's axial ratio (c/a = 1·4407) is 3/2 greater than that (c/a = 0·961) give by X-ray measurements [M.A. 8–291]. The space-group is $D^1_{6\bar{h}}$ (not $D^1_{3\bar{h}}$ or $D^3_{3\bar{h}}$ From published analyses the formula is deduced as $Mn^{II}_4Mn^{IV}_3(O_8.SiO_4)$ = $Mn^{IV}SiO_4.2Mn^{II}_2Mn^{IV}O_4$, with isomorphous replacement of some Mn^{II} by Sb^{III} an Ca, and of Mn^{IV} by Fe^{III} and Mg, and four molecules in the unit cell. L. J. S.

Meixner (Heinz). *Eine Korundlagerstätte bei St. Jakob (Oststeiermark).* Zentra blatt Min., Abt. A, 1942, pp. 144–151.

Pleochroic blue-black corundum (previously mistaken for blue hornblend occurs as grains with chloritoid, &c., in small nests in phyllites and chlorit schist near Birkfeld in east Styria. L. J. S.